



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/629,650

07/30/2003

Tsutomu Kadotani

Q76784

6845

23373 7590 12/17/2008
SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER

DUONG, THOI V

ART UNIT

PAPER NUMBER

2871

MAIL DATE

DELIVERY MODE

12/17/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

DETAILED ACTION

1. This office action is in response to the response filed September 16, 2008.

Claims 2-4 and 11-20 were cancelled and claims 1, 5-10 and 21-29 are currently pending in this application.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 22 is rejected under 35 U.S.C. 102(b) as being anticipated by Funada et al. (Funada, US 4,705,360).

As shown in Fig. 3, Funada discloses an LCD device comprising:

a first substrate 2;

pixels disposed on the first substrate (corresponding to electrodes 3 and 4);

a second substrate 1 coupled to the first substrate 2;

a sealing member 7 creating a gap between the first substrate and the second substrate;

a liquid crystal layer 8 disposed in the gap; and

spacers 6 disposed in the liquid crystal layer 8,

wherein the LCD device comprises a display region (having an orientation film 5) for displaying images and a non-display region (without the orientation film 5) which does not display images;

Art Unit: 2871

wherein the display region includes the pixels;

wherein the non-display region is disposed between the display region and the sealing member 7;

wherein the spacers 6 are arranged only in the display region and not in the non-display region (see Abstract and col. 3, line 56 through col. 4, line 25); and

further comprising a depression (between the sealing member 7 and the ends of the orientation film 5) which receives excess liquid crystal from the liquid crystal layer so that the gap between the first substrate and the second substrate is substantially uniform in the display region (col. 4, line 45 through col. 5, line 20); and

wherein the depression is substantially vacant except for the excess liquid crystal.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Funada et al. (Funada, US 4,705,360) in view of Yanagawa et al. (Yaganawa, US 2002/0075442 A1).

Funada discloses an LCD device that is basically the same as that recited in claim 27 except for the spacers comprising a plurality of discrete spacers.

As shown in Fig. 25, Yanagawa discloses spacers SP comprising a plurality of discrete spacers for ensuring the gap between the substrates SUB1 and SUB2 (paragraph 22).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the LCD device of Funada with the teaching of Yanagawa by forming spacers comprising a plurality of discrete spacers in order to ensure the gap between the substrates (paragraph 22).

Re claims 28 and 29, as shown in Figs. 1-5 of Yanagawa, the spacers comprises a plurality of discrete spacers arranged in a matrix with a plurality of rows and columns, wherein the spacers are pole-shaped.

6. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Funada et al. (Funada, US 4,705,360) in view of Kijima et al. (Kijima, US 6,259,500 B1).

The LCD device of Funada as described above includes all that is recited in claim 23 except for the depression having a height H satisfying a relationship of $H \Rightarrow (1/2) \times (1000 + L) \times [0.02d + [L \times (0.02d/1000)]]/L$ (micrometer), where the non-display region has a width L and the gap in the display region has an average value d . Kijima discloses an LCD device having spacers formed in the display region and none of the spacers being formed in the non-display region (Fig. 8b).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to have the relationship $H \Rightarrow (1/2) \times (1000 + L) \times [0.02d + [L \times (0.02d/1000)]]/L$ satisfied (col. 16, lines 17-46), since one would be motivated to suppress the level of non-uniformity due to variation in cell thickness to an acceptable

Art Unit: 2871

level so that a convex/concave profile can be provided (col. 16, lines 17-47). Ultimately this serves to help realize a uniform cell thickness across the entire panel and improve display quality (col. 5, lines 7-29).

Allowable Subject Matter

7. Claims 1, 5-10, 21 and 24-26 are allowed.

The following is an examiner's statement of reasons for allowance: none of the prior art of record fairly suggests or shows all of the limitations as claimed.

Specifically, re claim 1, none of the prior art of record discloses, in combination with other limitations as claimed, an LCD device comprising a depression formed on an inner surface of the first or second substrate, wherein the depression is located in the second part of the liquid-crystal layer corresponding to the non-display region, and the depression constitutes a buffer space which receives extra liquid crystal from the liquid crystal layer; and wherein the depression is substantially vacant except for the extra liquid crystal.

The most relevant reference, US 5,978,065 to Kawasumi et al. (Kawasumi), fails to disclose or suggest the claimed invention.

As shown in Figs. 5A and 5B, Kawasumi discloses an LCD device comprising spacer particles and depressions 9a and 9b (grooves) formed on inner surfaces of the first substrate 1 and the second substrate 2 respectively, wherein the depressions are located in the non-display region formed between the display region including pixel electrodes 104 and the sealing member 3 for receiving excess liquid crystal from the liquid crystal 4 (col. 7, line 52 through col. 8, line 39). Kawasumi also prefers to have the

Art Unit: 2871

liquid crystal 4 mixed with the spacer particles for controlling the cell gap (col. 5, lines 53-55). However, Kawasumi is silent about arranging the spacer particles only in the display region and not in the non-display region.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

8. Applicant's arguments filed September 16, 2008 have been fully considered but they are not persuasive.

Applicant argued that Funada fails to disclose "a depression which receives excess liquid crystal from the liquid crystal layer so that the gap between the first substrate and the second substrate is substantially uniform in the display region"; between the sealing agent 7 and the ends of the orientating film 5, liquid crystal 8 is disposed, there is no presence of a depression for excess liquid.

The examiner disagrees with Applicant's remarks since Fig. 3 of Funada shows a substantially similar structure as claimed, wherein a depression is located in the non-display region between the sealing agent 7 and the ends of the orientating film 5 and filled with excess liquid crystal from the liquid crystal layer 8. It is noted that this liquid crystal is excess liquid since it is disposed in the depression formed in the non-display region. As shown in Fig. 12 of the instant invention, the excess liquid crystal is disposed in the depression 68 formed in the non-display region 20. Further, Funada also

Art Unit: 2871

discloses that the liquid crystal display cell is finished with a uniform thickness due to removal of excess liquid crystal by way of injection opening (col. 4, line 45 through col. 5, line 20).

Therefore, Funada does disclose a depression that is substantially vacant except for the excess liquid crystal in the non-display region. Furthermore, where the claimed and prior art products are identical in structure, a prima facie case of anticipation has been established (MPEP 2112.01). Accordingly for at least these reasons, Funada anticipates all the features as presented in claim 22.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thoi V. Duong whose telephone number is (571) 272-

Art Unit: 2871

2292. The examiner can normally be reached on Monday-Friday from 8:30 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms, can be reached at (571) 272-1787.

/Thoi V. Duong/ - Primary Examiner

December 9, 2008